SLOVENSKI STANDARD
SIST EN 50346:2003

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Information technology - Cabling installation - Testing of installed cabling

Information technology - Cabling installation - Testing of installed cabling

Informationstechnik - Installation von Kommunikationsverkabelung - Prüfen installierter Verkabelung

Technologies de l'information - Installation de câblage - Essai des câblages installés

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English version

Information technology - Cabling installation - Testing of installed cabling

Technologies de l'information - Installation de câblage - Essai des câblages installés

Informationstechnik - Installation von Kommunikationsverkabelung - Prüfen installierter Verkabelung

This European Standard was approved by CENELEC on 2002-11-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC
European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Foreword

This European Standard has been prepared by Technical Committee CENELEC TC 215, *Electrotechnical aspects of telecommunication equipment*.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50346 on 2002-11-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2003-11-01
- latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2005-11-01

Annexes designated “normative” are part of the body of the standard.
In this standard, Annex A is normative.

This standard covers the testing of installed balanced and optical fibre cabling conforming to either series EN 50173 (generic cabling) or installed cabling conforming to dedicated, application-specific specifications such as series EN 50098. Thus EN 50346 covers a broader scope than EN 61935-1, which is restricted to the testing of installed balanced cabling according to EN 50173-1.

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Introduction

Within premises, the importance of the information technology cabling infrastructure is similar to that of other fundamental building utilities such as heating, lighting and mains power supplies. As with other utilities, interruptions to service can have serious impact. Poor quality of service due to lack of planning, use of inappropriate components, incorrect installation, poor administration or inadequate support can threaten an organisation's effectiveness.

A series of European Standards have been prepared to support the successful installation of information technology cabling. These are

- for design – EN 50173-1 and relevant application standards (for example, EN 50098-1 and EN 50098-2),

- for specification, implementation and operation – EN 50174-1, EN 50174-2 and EN 50174-3.

This European Standard specifies the requirements for the testing of installed balanced copper and optical fibre cabling. Such testing is commonly undertaken at contract interfaces and the requirements of this standard take the form of defined test procedures ensuring that results obtained are relevant, repeatable and credible.

These test procedures may be

a) referenced within the installation specification,

b) used during the implementation phase of the installation,

c) used during the operational phase to diagnose application failures at the cabling level.

This standard does not define which tests should be applied or the quantity or percentage of installed cabling to be tested. The test parameters to be measured and the sampling levels to be applied for a particular installation should be defined in the installation specification and quality plans for that installation prepared in accordance with EN 50174-1.

1 Scope

This standard specifies procedures for testing the transmission performance of installed information technology cabling in premises. These procedures apply to both balanced copper and optical fibre cabling.

These test procedures may be used for

– acceptance testing against agreed cabling performance limits,

– verification of specific application support,

– the investigation of faults.

These test procedures are not suitable for components or cable assemblies such as patch cords and equipment cords.

For each test procedure this standard specifies

a) test parameter,

b) the test method(s),

c) test system,

d) test equipment,

e) cabling interface adaptor,

f) measurement procedure,

g) calibration,

h) interpretation of test results,

i) documentation.

Limits for the parameters under test are specified in relevant cabling and application standards.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 50289-1-6, *Communication cables - Specifications for test methods – Part 1-6: Electrical test methods – Electromagnetic performance*

EN 60825-1, *Safety of laser products - Part 1: Equipment classification, requirements and user's guide (IEC 60825-1:1993)*

EN 61280-4-2:1999, *Fibre optic communication subsystem basic test procedures – Part 4-2: Fibre optic cable plant - Single-mode fibre optic cable plant attenuation (IEC 61280-4-2:1999)*

EN 61300-3-4, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-4: Examinations and measurements – Attenuation (IEC 61300-3-4:2001)*

EN 61300-3-6:1997, *Fibre optic interconnecting devices and passive components - Basic test and measurement procedures – Part 3-6: Examinations and measurements – Return loss (IEC 61300-3-6:1997)*

EN 61935-1:2000, *Generic cabling systems – Specification for the testing of balanced communication cabling in accordance with EN 50173 - Part 1: Installed cabling (IEC 61935-1:2000)*

EN 61935-1:2000/A1:2002, *Generic cabling systems – Specification for the testing of balanced communication cabling in accordance with EN 50173 – Part 1: Installed cabling (IEC 61935-1:2000/A1:2002)*

3 Definitions, abbreviations and symbols

3.1 Definitions

For the purposes of this European Standard the following definitions apply:

3.1.1
calibration
set of operations that establish, under specified conditions, the relationship between values of quantities indicated by a measuring instrument or measuring system and the corresponding values realised by standards

NOTE 1 The result of a calibration permits either the assignment of values of measurands to the indications or the determination of corrections with respect to indications

NOTE 2 A calibration may also determine other metrological properties such as the effect of influence quantities

NOTE 3 The result of a calibration may be recorded in a document, sometimes called a calibration certificate or a calibration report

[EN ISO 7500-1:1999, modified]

3.1.2
cabling interface adaptor
test cords and other components used to connect test equipment to the cabling under test

3.1.3
connection
mated device or combination of devices including terminations connecting two cables or cable elements

3.1.4
contract interface
point, in time, at which the responsibility for the supply of the cabling infrastructure passes from one organization to another

3.1.5
equipment cord
cable assembly enabling the attachment of transmission equipment and terminal equipment to a link

NOTE In the case of EN 50173-1, the equipment cord used to attach terminal equipment at the telecommunications outlet is termed as the work area cord

3.1.6
fail result
measured value which fails to meet the specified requirement and where the absolute value of the difference between the measured value and the specified requirement is greater than the stated measurement accuracy

3.1.7
local test equipment
test equipment used to perform or control the test procedure

3.1.8
marginal result
measured value which differs from the specified requirement by an amount not exceeding the stated measurement accuracy

3.1.9
normalisation
process of adjusting reference levels within the test system to ensure that the stated test system accuracy is achieved

3.1.10
pass result
measured value which meets the specified requirement and where the absolute value of the difference between the measured value and the specified requirement is greater than the stated measurement accuracy

3.1.11
remote test equipment
test equipment at the opposite end of the cabling under test to the local test equipment

NOTE Not all tests require the use of remote test equipment

3.1.12
termination point
interface enabling connection to the cabling under test

3.1.13
test cord
cable assembly used either to connect test equipment to the cabling under test or as part of a test reference measurement

3.1.14
test operator
person or organisation undertaking the test in accordance with instructions provided by the test system designer

3.1.15
test system
test equipment and cabling interface adaptors necessary to undertake a given test/measurement in accordance with the requirements of this standard

3.1.16
test system designer
person or organisation which supplies and specifies the test system for a given test procedure

NOTE The test system designer could be the supplier of the test equipment in conjunction the necessary cabling interface adaptors. Alternatively the test system designer could be an individual who selects the test equipment and defines the requirements for the cabling interface adaptors

3.2 Abbreviations

ACR	Attenuation to crosstalk ratio
CPR	Coupled power ratio
EQP	Transmission or terminal equipment
ELFEXT	Equal level far end crosstalk loss
FWHM	Full width half maximum
NEXT	Near end crosstalk loss
PSACR	Power sum attenuation crosstalk ratio
PSNEXT	Power sum near end crosstalk loss
TEST EQP	Test equipment

3.3 Symbols

Termination point

Connection

4 General requirements

4.1 Location of measurement (test) interfaces

4.1.1 Cabling under test

The cabling under test shall be either a channel or a link. Tests applied to channels are generally used for application trouble-shooting. Tests applied to links are generally used to verify the initial performance of the link.

Termination resistors shall be removed from all termination points connected to the cabling under test unless required by the test method.

4.1.2 Channels

A channel is a specific configuration of fixed cabling and flexible cables (jumpers, patch cords and equipment cords) to which transmission/terminal equipment is connected (see Figure 1). Although the equipment cords are terminated at both ends, definitions of channel performance exclude the connection at the transmission/terminal equipment.

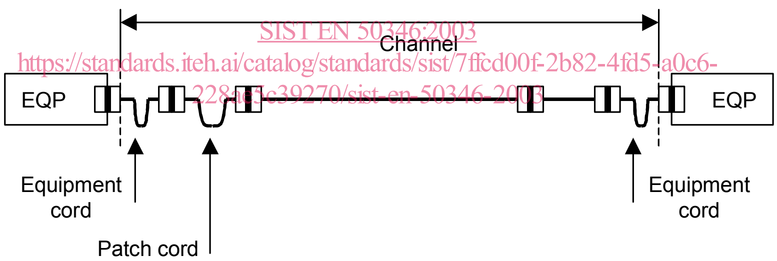

Figure 1 - Example of a cabling channel

4.1.3 Links

A channel contains one or more cabling links interconnected by jumpers and cords. Although each end of a link features a termination point, definitions of link performance include the connection at these termination points (see Figure 2).

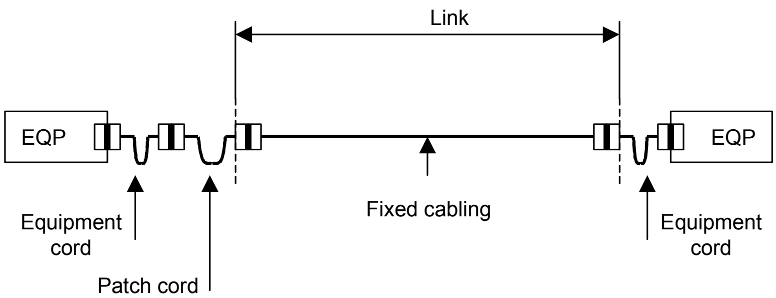

Figure 2 - Example of a cabling link

4.1.4 Reference planes for balanced copper and optical fibre cabling (point-to-point)

The accuracy of the test system is defined at its reference plane. The reference planes for channels and links are defined according to Figure 3.

The test configuration reference plane at each end of a channel is within the equipment cable next to, but excluding, the connection of the equipment cable into the test equipment.

The test configuration reference plane of a link is within the test cord cable next to, and including, the test cord connection which mates to the termination point of the link under test.

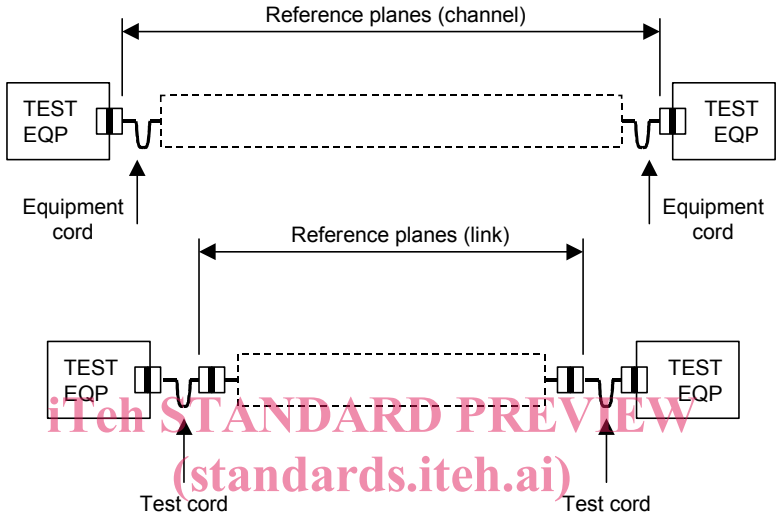

Figure 3 - Reference planes for link and channels (point-to-point)

4.1.5 Reference planes for balanced copper cabling (bus)

The test equipment shall be connected to the start and end termination points.

The accuracy of the test system is defined at its reference plane. The reference planes for channels and links are defined according to Figure 4.

The test configuration reference plane at each end of a channel is within the equipment cord next to, but excluding, the connection at the test equipment.

The test configuration reference plane of a link is within the test cord next to, and including, the connection at the termination point of the link under test.